Remarks:

Reconsideration of the application is requested.

Claims 1 and 4-13 remain in the application. Claims 1, 12, and 13 have been amended. A marked-up version of the claims is attached hereto on separate pages. Claims 2 and 3 have been cancelled.

In item 1 on page 2 of the above-identified Office action, the specification has been objected to because of the following informalities: The Examiner has stated that "cylinder 46" (page 10, line 6) should be "cylinder 110". The specification has been amended so as to overcome the objection by the Examiner. A marked up version of the changes is attached hereto on separate pages.

In item 2 on page 2 of the Office action, claims 1-13 have been rejected under 35 U.S.C. § 112.

More specifically, the Examiner has asked, regarding claims 1, 12, and 13, how one makes a laser device to produce laser radiation having ultrashort pulses with a duration of less than 1 ns.

Applicant respectfully disagrees with the Examiner on the above-mentioned rejection. The references listed on page 7, line 20 through page 8, line 3 of the specification of the instant application (P.W. Milonni and J.H. Eberly, "Lasers", Wiley, New York, NY, 1988, and, P. Vasil'ev, "Ultrafast diode lasers", Artechhouse Inc., 1995), clearly enable a person of ordinary skill in the art to make and/or use a laser device to produce laser radiation having ultrashort pulses with a duration of less than 1 ns, as recited in claims 1, 12, and 13. Therefore, the claims have not been amended to overcome the rejection.

In item 3 on page 3 of the Office action, claims 1, 3, 4, and 9-13 have been rejected as being fully anticipated by Rothrock (U.S. Patent No. 3,657,510) under 35 U.S.C. § 102.

In item 4 on page 4 of the Office action, claims 2 and 8 have been rejected as being obvious over Rothrock (U.S. Patent No. 3,657,510) in view of Huber (U.S. Patent No. 5,208,819) under 35 U.S.C. § 103.

In the fourth paragraph on page 5 of the Office action, claims 5-7 have been rejected as being obvious over Rothrock (U.S. Patent No. 3,657,510) in view of Haas et al. (U.S. Patent No. 5,874,981) under 35 U.S.C. § 103.

The rejections have been noted and the claims have been amended in an effort to even more clearly define the invention of the instant application. Support for the changes is found in claims 2 and 3 of the instant application.

Before discussing the prior art in detail, it is believed that a brief review of the invention as claimed, would be helpful.

Claims 1, 12, and 13 call for, inter alia:

"at least one semiconductor laser being operated in multimode, being mode coupled".

The Rothrock reference does not show at least one semiconductor laser being operated in multimode, being mode coupled, as recited in claims 1, 12, and 13 of the instant application.

Regarding item 4 on page 4 of the Office action, rejecting claims 2 and 8 over Rothrock (U.S. Patent No. 3,657,510) in view of Huber (U.S. Patent No. 5,208,819) under 35 U.S.C. § 103, it is noted that the Huber reference discloses an optical source with a frequency stabilization using an optical fiber resonator and a wavelength control loop. The purpose of this device is related to optical fiber communications. The optical source can be a distributed feedback laser (DFB laser)

or a semiconductor laser (column 3, lines 21-25). The feedback mechanism for the control loop takes advantage of detecting a phase shift and/or amplitude change of the optical source (laser) by the resonator (column 3. lines 11-14). Only a small sample of the optical output of the optical source is coupled into the fiber resonator (Fig.1, optical coupler 11). In the fiber resonator, the optical output of the optical source is modulated by a periodic reference signal, which is coupled into the fiber resonator. The center frequency is the optical carrier frequency output of the optical source (laser) (column 3, lines 45-53).

A person of ordinary skill in the art would not have any motivation to combine the technical teaching of the Rothrock reference, pertaining to laser devices for altering surfaces, with the technical teaching of Huber, pertaining to laser devices for optical communication. The person of ordinary skill in the art would not combine these references in order to provide a device for forming images on printing plates using radiation emitted by a laser, which achieves a lower threshold energy density, due to the fact that the problem of threshold energy density is not addressed in the reference by Huber. While the Huber reference discloses an electrically pumped semiconductor laser, the Rothrock reference teaches an optically (flash lamp) pumped solid-state laser, which are completely different technologies.

However, assuming, arguendo, that a person of ordinary skill in the art would have considered the Huber reference, the teaching of the Huber reference would not lead to the invention of the instant application. The Huber reference does not disclose that the optical source is a multi-mode source and is mode-coupled. Contrary thereto the Huber reference stresses that the stabilized optical source (laser) produces an optical carrier at a wavelength λ (column 2, lines 7-10), meaning that the optical source is a continuous wave on one stabilized frequency. This is due to a so-called master oscillator, a precise frequency reference. The Huber reference does not disclose that the condition of his device can be modified except for frequency adjustment, which appears to be the essential aim of the device disclosed in the Huber reference.

In fact, it is well known in optics that frequency content Δv and pulse length Δt (oscillation time) are related via a Fourier transformation which leads to the condition that Δv is proportional to $1/\Delta t$. In other words, the more precise (narrower) a frequency is determined, the longer the pulse or oscillation takes place. A precise frequency reference necessarily involves a long oscillation, a continuous-wave oscillation.

The Haas et al. reference does not make up for the deficiencies of the Rothrock and Huber references.

It is accordingly believed to be clear that none of the references, whether taken alone or in any combination, either show or suggest the features of claims 1, 12, and 13. Claims 1, 12, and 13 are, therefore, believed to be patentable over the art and since all of the dependent claims are ultimately dependent on claim 1, they are believed to be patentable as well.

In view of the foregoing, reconsideration and allowance of claims 1, 4-13 are solicited.

In the event the Examiner should still find any of the claims to be unpatentable, counsel respectfully requests a telephone call so that, if possible, patentable language can be worked out.

Please charge any other fees which might be due with respect to Sections 1.16 and 1.17 to the Deposit Account of Lerner & Greenberg P.A., No. 12-1099.

Respectfully submitted,

LAURENCE A. GREENBERG
REG. NO. 29,308

For Applicant(s)

AKD:cgm

August 16, 2002

Lerner and Greenberg, P.A.
Post Office Box 2480
Hollywood, FL 33022-2480
Tel: (954) 925-1100
Fax: (954) 925-1101

A-2881

Marked-up version of the claims:

claim 1 (amended). A device for forming an image on a printing plate, comprising: [at least one laser, and an optical system for forming an image of radiation from the laser on the printing plate, said laser radiation having ultrashort pulses with a duration of less than 1 ns]

at least one semiconductor laser being operated in multimode, being mode coupled and emitting laser radiation having ultrashort pulses with a duration of less than 1 ns; and

an optical system for forming an image of the radiation from the laser on the printing plate.

claim 12 (amended). A printing unit, having at least one device for forming an image on a printing plate, comprising: [at least one laser, and an optical system for forming an image of radiation from the laser on the printing plate, said laser radiation having ultrashort pulses with a duration of less than 1 ns]

at least one semiconductor laser being operated in multimode, being mode coupled and emitting laser radiation having ultrashort pulses with a duration of less than 1 ns; and

an optical system for forming an image of the radiation from the laser on the printing plate.

claim 13 (amended). A printing machine[, comprising at least one printing unit having at least one device for forming an image on a printing plate, said device including at least one laser, and an optical system for forming an image of radiation from the laser on the printing plate, said laser radiation having ultrashort pulses with a duration of less than 1 ns] having at least one printing unit, comprising:

at least one semiconductor laser being operated in multimode, being mode coupled and emitting laser radiation having ultrashort pulses with a duration of less than 1 ns; and

an optical system for forming an image of the radiation from the laser on the printing plate.

A-2881

Marked-up version of the specification:

Replace the paragraph between page 9, line 22 and page 10, line 24 with the following: --Referring now to the drawings and, first, particularly to Fig. 1, thereof, there is shown therein an imaging device for forming an image on a printing plate situated on a rotatable cylinder. A light source 10 generates a pulsed laser beam 12 which, through the intermediary of an imaging optical arrangement 14, forms an image of a dot 16 on the printing plate 18, which is situated on a cylinder 110. The cylinder 110 is rotatable about an axis of symmetry thereof. This rotation is represented by the double-headed arrow B. The light source 10 can be moved parallel to the axis of symmetry of the cylinder [46] 110 on a linear path represented by the double-headed arrow A. For continuous image-forming, the cylinder 110 with the printing plate 18 rotates in accordance with the rotational movement B, and the light source 10 moves along the cylinder in accordance with the translatory movement A. The result is image-forming which revolves around the axis of symmetry of the cylinder 110 on a helical path. The path of the dots 16 is represented by the line 112. By a line 114 for power supply and control, the light source 10 which emits pulsed laser beams 12 is connected to the control unit 116. This control unit has a dc-source 120 and an ac-source 122 and also an electrical coupler 118,

wherein the dc and ac components of the supply voltage of the light source 10 are combined. In an alternative exemplary embodiment, the dot 16 can also be moved in a meandering form over the printing plate 18 as follows: first, a complete image-forming process is performed along a line parallel to the axis of symmetry 110 of the cylinder 18 and then a stepwise rotation about the axis of symmetry of 110 of the cylinder 18 is performed.--